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ABSTRACT

Letter and syllable dice devised for a project in rural Ecuador provide inexpensive, easily reproducible learning materials for practice in basic literary skills. Eleven wooden cubes with six letters on each cube are cast onto a surface and the player constructs words from the letters on the top side of the dice. After a word is formed and recorded, it may be taken apart to use the letters in forming another word. The player receives practice in assembling words from letters, and the observer gets exposure to words he doesn't know and reinforcement of words he vaguely knows. Both player and observers increase their spelling and vocabulary skills. Letter dice have been successfully used in community meetings, reform schools, and by Peace Corps members in English classes. Because syllable dice seem to be most effective in the early stages of literacy, they are used in the primary schools and in private tutoring sessions. In one approach the teacher draws a simple scene on the board and the students describe it by building words from the syllable dice. Attempts are presently in progress to adapt the dice to the native Quechua language. The author notes that although the materials have created interest, a satisfactory means of stematic evaluation has been difficult. The method of creating the dice and an illustration of the letter distribution are provided. (KC)

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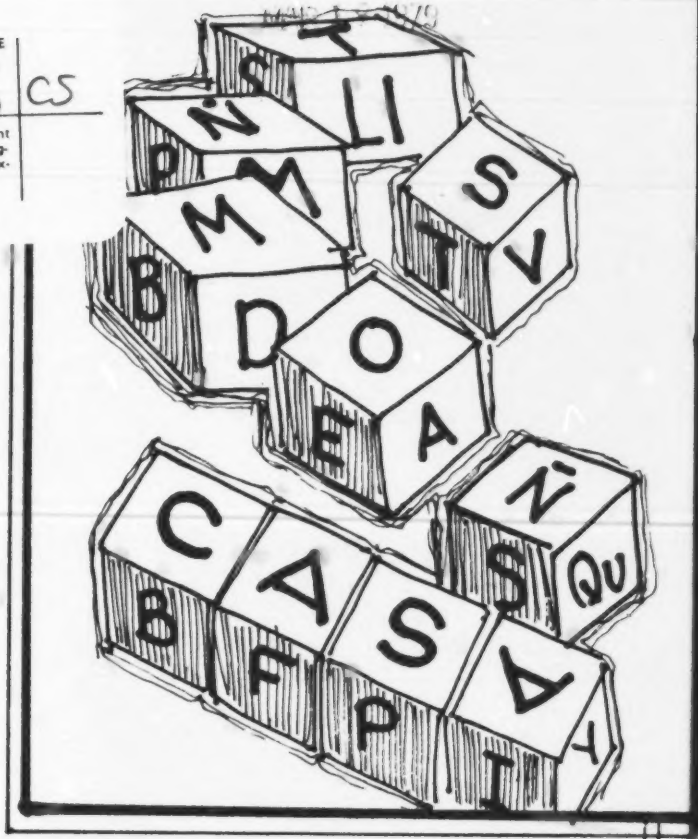

TECHNICAL NOTE NO. 6

LETTER DICE

NOTE WRITTEN BY: JOCK GUNTER

GAME DESIGNED BY: JAMES HOXENG
AMPARO BORJA

SO 011 573

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SUMMARY:

The player tosses eleven wooden dice, each face of which contains a letter. The letters showing are arranged and rearranged to assemble words. The aim is to develop fluency with the spelling of words, and to increase active and passive vocabulary.

This series of Technical Notes has been produced by staff members of the Ecuador Nonformal Education Project. Each note focuses on a particular issue or technique which has been developed and tested in Ecuador. The notes contain the information available at the time of writing and analytic comments based upon available evaluation data. However, the notes are in no way an evaluation of the project. Their purpose is to share ideas and information about new techniques as they are developed. Project staff want to encourage comments and suggestions from readers who may have had experience with similar techniques in other settings.

The project is financed by USAID and is a joint undertaking of the Ministry of Education in Ecuador and the Center for International Education at the University of Massachusetts. Ideas and materials derived from the ideas were created jointly by staff in Massachusetts and staff in Ecuador. All materials have undergone considerable change in the field as usage in various situations indicated needed modifications. The notes attempt to accurately credit the creators of each technique. In some cases, though, ideas have been modified by a variety of people and precise assignment of credit is difficult. In all cases, various members of the staff have made substantial inputs into the final version of the materials.

After three years of effort the number of people in Ecuador and in the United States who have made substantial contributions to this project is considerable. Rather than trying to enumerate the particular contributions of each, we will only note that this has been a genuine bi-national effort.

These Technical Notes are reports of work in progress and will be issued periodically as they are written. A small charge of $1.00 per copy will be made to partially defray the costs of reproduction and mailing. The Technical Notes are available in both English and Spanish and may be obtained by writing to:

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David R. Evans
Series Editor & Principal Investigator

LETTER DICE

ORIGIN & PURPOSE

Developing and maintaining literacy is a difficult problem in rural areas. People who have had some schooling, rapidly lose their literacy through lack of usage. Those without access to school who have learned to sound out letter symbols on their own have no mechanism to proceed further. Both of these types of people need to achieve greater fluency in skills which are part of functional literacy. Among these skills are the deciphering of words and their assembly from letters. Practice in these skills should translate into an ability to sound out unknown words, and to place in written form words previously known only in speech. Active and passive vocabulary should increase, along with confidence and ability in spelling. In other settings, people gain these fluency skills by making use of a wide variety of reading materials.

In rural areas suitable written materials, or for that matter almost any type of written materials, are lacking. Poor campesinos cannot normally afford newspapers, magazines, or books - even if they were readily available. Furthermore, existing written materials tend to be oriented toward the urban Spanish culture, with little relevance to the life and needs of the campesinos. Campesino newspapers do exist, usually as part of community development efforts, but they generally lead a precarious economic life and reach only small numbers of people. Materials are needed which are cheap, easily reproducible, and which provide the needed practice in basic literacy skills. The letter dice described in this technical note provide an example of such material.

SETTING

The letter dice are currently used most often in rural night-time groups by six to ten people at a time. The dice are frequently used as the main fluency exercise in conjunction with a modified form of the Ashton-Warner approach to self-expression and literacy. (See Technical Note #5). However, the dice are also in use in a number of other settings; an urban reform school, English classes in a vocational school, primary school reading classes, in a range of tutoring situations, and in Quechua literacy classes. In fact, the dice can be used by any person or group of persons in virtually any situation where there is a small flat surface and enough light to see.

BASIC METHOD

The letter dice consists of eleven wooden cubes approximately one and one-half inches on a side. They are unpainted wood, with six letters handwritten on each cube - one letter on each face. To play, an individual casts the entire set on the surface and proceeds to construct words from the eleven letters which are on the top sides of the dice. The player forms words by using whatever letters he wishes from among those showing. Once a word is formed, it can be recorded by someone else, and then the player takes it apart to use the letters in forming another word. He continues until he reaches a time limit, or cannot think of anymore words.

In a group situation, observers will try to discover words before the player does. Observers often give hints, or say the word aloud, if the player is having trouble. Once the player has exhausted his recall of words using

the given letters, another member of the group will take a turn.

This usage of the game provides practice in various skills for both the player and the observer. The player must search his memory for words that are triggered by viewing the letters visible. He must then review the words, or spell them out with the dice, and see if they look correct. At this point, the player will look to the group for confirmation of his word.

The more accomplished observers will have accompanied the player through the entire process, insofar as the size and "activeness" of their vocabulary permits. Less accomplished observers will either have a reaction to a word they know passively, or content themselves with getting to know a combination of letters their fellows will brand as either meaningful, or incorrect.

The player gets practice in assembling words, learning from both the words he can assemble, and gaining clues as to why he cannot successfully assemble certain other words. The observer gets an increase in his passive memory, exposure to words he does not know, reinforcement of words he half-way knows, and perhaps activization of some words already in his passive memory. Both player and observer should gain overall reinforcement of their vocabulary and spelling ability.

Another effect may be to make written culture less threatening to the campesino by eliciting from him words that have become his own. Group members learn new words from other campesinos rather than from a magazine or book printed in the city. Presumably, the words that campesinos teach each other will be more relevant to rural life and of greater interest than those found in reading materials from the outside.

Curiously, there is little competitive spirit in evidence when the dice are used by rural groups. Nonetheless, in the evaluation design used by the project in some short field laboratories, a competitive model was employed with apparent success. Players became very excited, and seemed to enjoy competing in teams when such a structure was provided. When they play the game among themselves, however, they often choose cooperation over competition.

FURTHER APPLICATIONS

Reform School

Competition is the order of the day when the dice are used in a Quito reform school. The teacher notes a type of word machismo on the part of proven team leaders. The dice are used as a supplement to a formal reading curriculum. They are useful between classes, or whenever the students become unruly. A teacher in the school reported that the time when the dice are used is the only part of the school day when discipline is not a problem. He considers the dice a useful means of motivating and teaching difficult students.

English Classes

In the John F. Kennedy Vocational School in Boca de los Sapos, a Peace Corps volunteer is using the letter dice to teach English spelling, vocabulary, and pronunciation. The dice are very popular, and are produced only after the class "business" has been transacted. Interest is so high that lessons cannot be reviewed; assignments cannot be given once play has begun.

The competitive air and the excitement generated have one very specific pay-off. The dice game is a highly effective means of reducing the students' inhibitions about trying to pronounce English words. During the game, words are shouted out as they are spelled. By shouting aloud, the volunteer is able to correct the students' pronunciation. He can also correct spelling, and accept or reject words, as the students create them with the dice.

Primary School

The same school serves as a primary school during the day. The director of the school learned of the dice from the Peace Corps volunteer, and decided to try them with his first grade class. He adapted them to accompany the lessons in the text book, producing sets of dice containing syllables. The first lesson in the book introduces the syllables "pa, pi, pe, po, pu."

The director divides the children in the class into groups of five, seats them around small tables, and deposits two dice on each table, both containing the syllables, "pa, pi, pe, po, pu". The class is asked to hold a particular syllable such as "pu", and later to form words like "papa", "pepe", "pupo".

He feels the dice can help develop fluency with syllables, and ensure that every student works actively with the material absorbed passively from the book. Chances are greatly increased that all students will gain an understanding of the material covered.

Tutoring

Carlos Poveda, of the Ministry of Education's Adult basic Education program, became interested in letter dice, and began using them to teach reading to a 23-year old illiterate, and to his five and one-half year old son. He became convinced that, for Spanish, syllables were a more efficient building block than letters.

Since Spanish is phonetic, and since vowels and consonants maintain the same sound whatever the context, it seemed an unnecessary complication to break syllables into vowels and consonants. Furthermore, the consonants on the letter dice make no sound by themselves. Until combined with a vowel they are pure abstractions. However, syllables, which include live vowels do make a sound, and can be called by that sound. Linguistic units that sound are far more useful to the learner than letters which must be given a separate name.

Finally, if for example, the word "casa" is a combination of two units instead of four, the word will be easier for the student to discover. In the early stages of literacy, successes should be fostered and rewards guaranteed as much as possible. Using syllables instead of letters appears to be a way of doing this.

Mr. Poveda produced a set of syllable dice, and was very excited by the speed with which he was able to teach reading. His adult student learned in three months, and his son in four. It would be interesting to test skill levels of these students against the levels of students who used letter dice for the same amount of time under similar conditions, and against more

traditional teaching techniques.

Mr. Poveda has interesting ideas for perfecting his system. For instance, he feels that initially it is not necessary to include every possible spanish syllable, but only those which the illiterate or semi-illiterate is liable to know. He also feels that it is important that the syllables which appear most commonly in campesino Spanish appear most frequently on the dice.

Which syllables can safely be dropped, without depriving the student of words he might know? How should the syllables and vowels be positioned on the dice so as to facilitate the forming of common words, and to foster reinforcement and satisfaction for the student? The Project staff will be collaborating with various Ecuadorian institutions on these technical problems during the second stage of the non-formal education project.

Puñachizac

Interestingly, a third syllable dice adaptation was invented independently, in the village of Puñachizac, (a rural Andean community with some 800 inhabitants). The Ministry of Education teacher in that town learned of the dice from that town's facilitators. The teacher then began to use the dice in his own classes.

Soon, he arrived at the notion of adding syllable dice to the set. He found that rural children had a remarkable memory, and were able to reconstruct a word they had been taught very rapidly when syllable dice were used instead of letter dice.

During his classes, the teacher keeps the dice on a rack above the black board, in plain view. To test the students' knowledge, he reports, he will draw a simple design on the board, and ask the students to describe what is happening by building words from the syllable dice.

Quechua Literacy Programs

Four attempts to adapt the letter dice to Quechua-speaking communities are underway: the non-institutional and SEV (an Ecuadorian Volunteer Scheme) efforts in the Cachisagua region, the Summer Institute of Linguistics in Limoncocha and the individual experiences of Peace Corps volunteers working in and around Ambato. A conversation with one of those volunteers,* revealed some of the problems in using the existing version of letter dice in Quechua.

Quechua is not generally a written language. Although several writing systems have been developed, the systems conflict. Quechua speakers generally know none of them. However, they may read and write some Spanish.

The source of conflict between existing Quechua, writing systems, seems to derive from incompatibilities between the Spanish and Quechua vowel systems. Spanish, has five vowels - (a, e, i, o, u) whose sounds are relatively constant wherever they appear in the language. Quechua, has a three vowel system consisting of one vowel whose sound is somewhere between "o" and "u", one vowel somewhere between "i" and "e", and the vowel "a". Furthermore, the exact sound of these vowels varies significantly from village to village.

*Hugh Duffner

Should one standardize the writing system even though it may distort the representation of vowels for some communities? Should one reduce the number of vowels found on the Quechua dice to three? How should they be represented? For instance, writing them as follows

i-e

a

o-u

more accurately represents the Quechua vowel system, while leaving flexibility to accommodate varying vowel pronounciations in different communities. This flexibility might be gained, however, at the expense of a cumbersome means of writing vowels. Understanding of the Spanish five vowel system might also be impaired.

The problem of differentiating vowels is not a trivial one. This observer has seen many Quechua speakers agonize over whether to place an "i" or an "e" in a Spanish word. In such instances the dice in their present form may create frustration, instead of the fluency and self-confidence they were designed to produce.

The University of Massachusetts hopes to compare the effectiveness of several variations of letter dice for Quechua speakers, once those variations are developed. The Summer Institute of Linguistics at Limoncocha* was supplied 500 sets of blank dice, in order to work on this problem with Quechua-speaking community leaders.

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*This missionary-run institution trains leaders from many tribes of the Eastern jungle lowlands. Literacy materials for indian languages are a priority of the Institute.

Concentration - Syllable Chips

One of the facilitators in Punachizac has incorporated the concept of the syllable dice into a concentration game of his own invention. Small chips, containing either a syllable or a number, are placed face down in rows and columns. Each player turns over two chips, and tries to form a word or perform an arithmetic operation. He may also use any chips tur ned over previously if he can r emember their location. If he succeeds he keeps the chips, if not. he replaces them face down and the next player tries.

DESIGN OF THE LETTER DICE

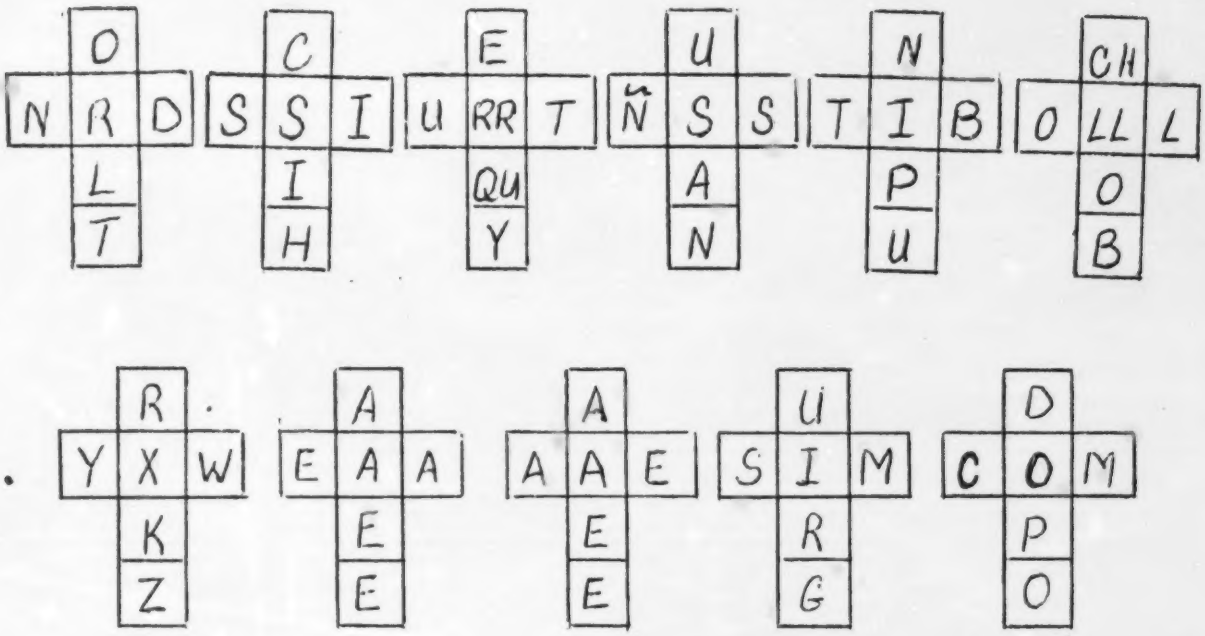
Several technical decisions were required to assemble the set of letter dice. How frequently should each letter appear in the set? How many dice should be used? How should the letters be distributed on the faces of the dice? Should common double letters appear together on the same face? There was little research evidence on which to base these decisions. Rather than waiting to accumulate a solid bank of evidence, a series of quick estimation procedures were adopted to enable pilot sets of dice to be produced immediately.

First, the letters "ch", "n", and "rr" were added to the Basic Spanish alphabet. Later the symbols "ll" and "qu" were added because of their frequent occurrence together. Then a simple estimation procedure was used to arrive at an approximation of frequency distribution of the letters in the alphabet. Three paragraphs were chosen at random from several different books, and the frequency of occurrence of each letter was counted and tabulated. The resulting distribution was checked against several other sources including a Spanish version of the game Scrabble.

In the future, a more extensive analysis of useful distributions of the letters will be undertaken. This will involve using a wider variety of source materials including local newspapers, tapes of radio broadcasts, and tapes of conversations between ordinary campesinos in the areas where the dice are to be used. Probably several recommended distributions will result, depending on the setting and the learning level of the people who are to use the dice.

As indicated earlier, a decision was made to use eleven dice in each set. The number was felt to provide a wide enough range of letters on any given throw of the dice to make word construction easy. At the same time, the set is small enough to be easily handled by one person. Smaller or larger sets could well be desirable for different settings.

The remaining problem was the placement of the needed 66 letters on the eleven cubes. Commonly used vowels are essential to the formation of simple words. To insure that "a" and "e", the two most common vowels were always available, two dice contain only these vowels. (See chart at end of this section). Less frequently occurring vowels are scattered over the remaining dice. Likewise, infrequently occurring consonants like "k" and "x" and "w" were placed on one cube, insuring that only one of those would occur at a time. (This has the effect, of course, of removing certain words from the set of words that can be constructed with the dice). The resulting arrangement of letters has been found to work well in the field, but has not yet undergone any testing and comparison with other possible arrangements. The distribution currently being used is diagrammed on the following page:



EVALUATION

During the summer of 1972 a small evaluation laboratory was run using the letter dice. The experiment was designed to test the hypothesis that "a 60 to 90 minute time period spent playing with the letter dice in a small group would result in a measurable improvement in the ability to form words from letters." Participants were randomly assigned to control and treatment groups. Members of the control groups worked with number dice rather than with letters. Pre and post tests consisted of sheets of paper with half the alphabet at the top of the page.

Despite pretesting of the methods, a number of difficulties became apparent

when a larger scale application was made. Problems occurred most seriously in the measurement techniques being used. The dice encourage physical manipulation of letters to form words, and do not require use of pencil and paper. A paper test does not permit rearranging of letters, unless the student writes out the letters in a different order. It takes time to write out letters in different orders in search of words. This is especially true if the student is not familiar with and skilled in the use of paper and pencil. The test requires a complex skill not taught by the dice game. Peoples' difficulties in using pencil and paper may understate their ability to learn to form words from letter dice. In technical terms, pencil and paper testing are not a valid test of the behaviors taught by the letter dice.

Another difficulty with the tests occurred with the instructions. Can we repeat letters? Can we use other letters? Can we use names? Answering these and other questions invariably failed to satisfy students, who looked confused during the tests, and seemed far less adept with words, than they did when using the dice.

The data showed trends toward a ceiling effect among more skilled participants. Players with the lowest skill levels benefitted most from the exposure to the letter dice. Unfortunately, due to the testing problems mentioned above, these trends did not reach statistical significance.

Subsequently, other tests have been developed which parallel more closely the skills used in the game itself. Players are given cards containing one letter each. They are given two minutes to spell out as many words as they can. The behavior demanded by the test is thus made as close as possible

to the behavior developed by the dice game. This type of test has produced statistically significant results when applied to the evaluation of other games. The letter dice will soon be evaluated using this test.

COSTS

One of the major assets of the letter dice is their low production cost. Letter dice games have been made by members of the project staff at the following estimated costs:

		US$
Materials:		
a)	11 wooden blocks (1 1/2" x 1 1/2") @ US$0.024 each from a local carpenter	0.264
b)	Markers (each lasts for 25 copies, costs US$0.28)	0.011
Labor:		
	(By messenger/watchman whose monthly salary is US$40.00. Each set takes 6 minutes to produce).	0.025
	TOTAL	US$0.300

The result is 30¢ U.S. per finished set, when made in Quito where costs are relatively high. Staff members are quick to point out that the cost of reproduction at the village level would be much lower. Pieces of scrap wood might be used. People who know the village carpenter would get a better price. Finally, if learners made copies of the game in their spare time there would be no labor cost.

CONCLUSION

In the short period since their introduction the letter dice idea has shown remarkable attractiveness. It has been adopted in many different types of learning situations, and has spawned a wide range of adaptations and modifications. The continued usage of the materials and the interest which they have generated indicates their general value. Evaluation on a more systematic basis has run into difficulties in measurement procedures which are now being improved. The possibilities for evaluation of different versions and uses of the dice are considerable. Much of this is beyond the scope of the project itself. Hopefully, other interested practitioners will try the dice and will add to our knowledge of their effectiveness.

Game Outline

Name/Title: Letter Dice

Developed by: Pat Burke, James Hoxeng, Amparo Borja

Description: A skill practice device which deals with reading and spelling for new literates. Players also develop the ability to use combinations of letters to form new words.

Operating Time: Several minutes to several hours

No. of Participants: From 1-20

Subject Matter: Literacy

User Level: Children and adults

Components: 11 wooden dice, approximately 1 1/2" square, covered with letters. 66 letters or letter combinations. (See Chart on Page 12).

Game operation and rules

1. Finding a word. (Number may be varied for beginners). Players search for words from the letters showing. First player to find a word declares, and assembles his word. After group confirmation of it's correctness, play resumes, and players try to compose longer words from the same 11 dice. Play continues until the time limit is reached, and the player with the longest word is declared winner.

2. Building a word. The first player places a letter from one of the faces of a die in front of the group. The player to his right chooses another from the pile of dice, and places it next to the first letter. The object is to be the player who completes the word. When a word is

Game operation and rules (Cont'd):

completed, the next player tries to add to that word and form a longer word. At any point in the game any player may challenge the player who has just added a letter. The player who added the letter must then prove that he was working toward a legitimate word. Alternately, the game might be structured so that the player who completed a word had points scored against him. This is probably a more difficult version than the previous one. Both of these "building a word" versions are certainly more difficult than the "Find a word" version, since they require more active recall of words.

3. Word listing competition: Players compete to form the largest possible number of words from a given roll of the dice in a given amount of time. Individuals can compete or teams can play cooperatively. In either case, players alternate between two roles: onlookers who recognize and monitor words formed by other players, and active composers of words. This version is the most popular one in Ecuador at the moment.

TECHNICAL NOTES OF THE ECUADOR NON-FORMAL EDUCATION PROJECT

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12.	Puppets and The Theater	-	Description of the use of theater, puppets and music, within the context of an Education Fair, as instruments of literacy and consciousness awareness in a rural community.
13.	Fotonovela	-	Description of the development and use of the fotonovela as an instrument of literacy and consciousness awareness in the community.

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